

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

~~Sub #1~~ of William Flanagan
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for

SYSTEM AND METHOD FOR PROCESS MINING

Sub B2

This is a continuation in part of co-pending applications:

Application. Serial No. 09/192,735, entitled "System for Iterative, Multivariate Negotiations Over a Network" filed 11/16/98;

Application Serial No. 09/192,729, entitled "System and Method for Providing and Updating User
Supplied Context for a Negotiations System" filed 11/16/98;

Application Serial No. 09/192,979, entitled "System and Method for Representing Data and Providing Electronic Non-Repudiation in a Negotiations System" filed 11/16/98, 1"; and

Application Serial No. 09/192,848, entitled "System and Method for Ordering Sample Quantities Over a Network" filed 11/16/98.

EXPRESS MAIL CERTIFICATE

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BACKGROUND OF THE INVENTION

Technical Field This invention relates generally to systems for allowing a user to analyze data collected by an automated system of record to determine which processes used are efficient and effective.

5 Background Business entities have tried for years to adapt computers and networks for use in sophisticated intercompany negotiations for commercial purchase and sales transactions, but with results that usually fall far short of expectations. Early mainframe computer attempts, for example, usually involved one corporation's allowing its existing suppliers and quantity buyers to connect to its internal private, proprietary network, using specially written locally developed application programs and private, proprietary network connections. These private systems were usually extremely costly to develop and maintain (often costing in the multi-millions of dollars) and very often did not meet all the needs and changing requirements of the participating businesses. Since many corporations had different internal networks and computer systems, considerable effort went into working around incompatibilities. Additionally, these systems had to be based on already existing, close relationships between buyers and sellers and usually were also based on previously negotiated agreements. Thus, the systems did not help in searching for information about new buyers and sellers, nor with the evaluation or negotiation processes, nor with the documenting of those

20 processes from the beginning. They were not interactive, but typically batch processing systems, and usually accepted alphanumeric text only, not the inclusion of graphics or sound files. They usually addressed ongoing relationships previously worked out

manually, for which extremely expensive custom systems were developed at buyers' or vendors sites.

Most business (and many other) negotiation processes are usually multivariate. That is, a business negotiation deals with many variable items, such as price, quantity, quality, shippers, insurance, warranty, schedules, returns and so on. The above solutions typically did not automate multivariate negotiations in any way, since they had to be built on agreements whose terms had all been previously negotiated

With the advent of the Internet and the World Wide Web (Web), the *exchange* of information amongst companies was greatly enhanced, with the use of Web technologies. However, even with chat rooms, bulletin boards, and forum websites most of this data and information exchange is simply that— not a multivariate negotiations process nor an online, electronic commerce process.

While some of the Web devices, such as chat rooms and bulletin boards are interactive, each essentially allows two or more people to have conversations over the Internet, in the same way they might speak over the telephone or several might speak over an old-fashioned party line telephone. While the chat room or bulletin board may store these conversations, no other action takes place as a result of the process. Consequently, privacy and security questions aside, these are not effective devices to use to negotiate a number of variable terms, reach agreement on each and document the results. Just as telephone conversations about negotiations can be recorded on tape, but do not

produce a contract document on paper, online chat or bulletin board discussions about negotiations cannot easily be used to make a contract on the network, even if they are archived.

Extranet Web technology has been developed to enable a corporation to "talk to" (but not negotiate multiple variables in iterative bargaining with) its suppliers and buyers over the Internet as though the other companies were part of the corporation's internal "intranet." This information exchange is done by using client/server technology, Web browsers, and hypertext technology used in the Internet, on an internal basis, as the first step towards creating intranets and then, through them, extranets.

In typical intranet client/server technology, one computer acts as a Web server computer to perform complex tasks, while other, smaller computers or terminals are "clients" that communicate with the Web server. In typical client/server intranets the client requests data and performance of tasks from the Web server computer. A Web server program runs on the Web server computer to provide Web server functions. The communications between these intranet clients and Web servers is in Hypertext, or HyperText Markup Language (HTML)- - the "language" of the Internet's World Wide Web.

Usually, for intranets, at the Web server site, one or more people would create documents in hypertext format and make them available at the Web server. In many companies, employees have personal computers or terminals at their desks connected

While this has been an advance for internal communications over a private network, it does not usually provide any interactive, iterative, multivariate negotiations capabilities and it requires personnel familiar with HyperText Markup Language (HTML) to create hypertext links in documents to create and maintain the “internal” Web pages. If a more interactive approach is desired, an Information Technology (IT) specialist in some form of scripting, such as CGI, or PERL is needed who can create forms documents and procedures to allow users to ask for information from the Web server. Again, this is custom programming at the user’s site, and still does not provide multivariate negotiations or commerce capabilities.

Corporations that share information internally can also use workgroup software such as IBM's LOTUS NOTES™ software on the internal network. However, this, too, requires special programming and scripting for the unique needs of the organization, and normally does not address multivariate negotiations, even on an internal basis.

Since extranets simply extend a company's intranet to include selected other companies, the extranet concept usually does not provide any negotiations capabilities, either, much less electronic commerce capabilities.

To date, most attempts at adapting Internet technology to negotiations and commerce, even in small measure, have been focused on solving the problem from inside a corporation's systems going out and with the emphasis on the seller, not the buyer. Consequently, Intranet/Extranet options usually do not provide electronic commerce, only more sophisticated information distribution and sharing.

For corporations that sell at retail, one technique for selling goods over the Internet is shown in Figure 2b (Prior Art). This scheme uses the concept of a hosting "mall" Website that enables buyers to browse through stores (individual participating selling corporate Websites or aggregated catalog systems) and use a "shopping cart" feature for selecting items to purchase. Participating sellers in a mall create their own Websites which list items for sale and prices. The mall usually provides the shopping cart technique for the buyer to use to select items to buy. Such Internet sales techniques also use security systems for transmitting payments by credit card and 30b or CYBERCASH™ payment methods (not shown). Most of these mall Website are significantly limited in the interaction, if any, they allow between buyers and sellers. A few allow limited price negotiations between buyers and sellers, but none allow iterative, multivariate negotiation and bargaining for both price and terms, such as availability, shipping, carrier, payment methods, risk of loss, etc.

Similarly, for non-retail business buyers and sellers, the mall concept above has limited value, since it usually does not connote much about the integrity or capability of the participating businesses, nor provide all of the various payment options a business

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might want to use. Most of the present Internet and World Wide Web systems for commerce are directed to consumer purchases of retail items in small quantities, not to business to business transactions or consumer transactions negotiating for goods and services in large quantities on national or international terms.

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5 The companies that do provide more of a business to business focus over the Internet usually do so by offering special enterprise application server software 19s, as shown in Figure 2a (Prior Art) for installation inside an enterprise's private corporate network. These programs fit into a category of software called front-office applications or application servers -- so called because they sit close to the user end inside an enterprise and are customized to interface with the back-office applications 21 inside the enterprise, which include commercial products from software suppliers as well as custom developed applications that handle internal business functions such as inventory tracking, financials, human resources and supplies, and similar Enterprise Resource Planning (ERP) systems.

15 As seen in Figure 2a (Prior Art), three separate corporations 16a, 16b and 16c are shown using the services of an enterprise commerce site provider 18. Each corporate site 16 has a firewall 16af, 16bf, and 16cf. Firewalls are a combination of hardware and software designed to prevent unwanted intrusion into a private corporate network by unauthorized personnel. A firewall usually puts a specially programmed computer
20 system between its internal network and the Internet. It also prevents the company's

internal computer users from gaining direct access to the Internet, since the access to the Internet provided by the firewall computer is usually indirect and performed by software programs known as proxy servers.

Note that, as shown in Figure 2a (Prior Art), in a typical implementation of an enterprise commerce site provider 18, the enterprise commerce site provider 18 breaks through the firewalls 16af-16cf of each of its customers. Normally this is done in such a way as to provide secure access. Occasionally, if the commerce site provider 18 allows its customers to be linked for certain transactions over the Internet 04, over a common external link 10 to the Internet, internal security may be comprised, if the customer's firewall is configured incorrectly and the Internet transmission results in a breach.

Still in Figure 2a (Prior Art), note that the typical enterprise commerce site provider 18 must have each customer 16 install the provider's application server software 19s, on an application server computer 19h inside the corporation's private network 14. Thus, in order to have access to the commerce site, corporation 16a would have an individual working at a desktop computer 08, for example, connect to the corporation's internal Web server computer(s) 20h over internal private network 14. The corporate employee thus accesses the enterprise commerce site provider 18 through his or her corporation's Web server computer 20h, running the enterprise commerce site provider 18's application server software 19s. From the Web server 20h, application server software 19s, possibly running on its own application server computer 19h communicates through the firewall 16af with enterprise commerce site provider 18, and ultimately,

through that site to other corporate subscribers to the enterprise commerce site provider, 18 usually over a private leased network 11. The corporation's internal network 14 links the desktop computers 08 with not only the internal application server 19, but also to the internal corporate back-office internal computers 21.

5 Many, if not most, of the implementations of the enterprise commerce systems shown in Figure 2B(Prior Art) may also require the corporation to install a special database application server 13h, to run special database application software 13s along with the application server software 19s. Thus, if the corporation already has a Web server computer 20, and the corresponding software 20s, it still has to purchase at least the application server software 19s, possibly an additional computer to act as the application server computer 19h, and possibly yet another combination of database server computer 13h and database server software 13s, in order to use the enterprise commerce provider 18's system.

Because application server products 19h and 19s, and possibly additional database server hardware and software as seen in Figure 2a(Prior Art), have to be installed inside each participating corporation, customized to that corporation's internal back office systems 21, and backed by appropriate internal training support, it can cost in the several hundred thousands or millions of US dollars to purchase and install the systems and train internal people on their use. While a few of these applications connect buyers and sellers over the Internet, usually both the sellers and the buyers must also install and customize the application server software 19s inside their internal networks 14—

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Enterprise server/mall Website

Bank/credit card processor

1. transport the credit card information securely to processor or bank over a private network;	2. verify the card is legitimate and the amount exists; send authorization to online merchant over the private network;
3. post the item details back to the bank/credit card processor over the private network;	4. transport item details to card issuer for debit to the holder's account over private network
	5. make necessary currency translation (usually offline)
	6. credit the merchant account
	7. deduct significant fees, usually a percentage or more per transaction from the merchant account;
	8.archive details.

Credit cards are issued to buyers relatively easily, but merchant identifiers (merchant

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important part to existing manual methods.

Credit cards are essentially ways to pay cash in advance for goods and services, and thus, would not be suitable for production purchasing either, where delivery, payment, and inspection schedules are usually negotiated to occur over time. Thus, in a
5 production purchasing agreement, a buyer may only to agree to pay the seller in installments, after the seller has shipped a monthly quantity and the buyer has had a chance to inspect and accept them. Once the buyer has accepted a shipment, the seller would usually like the fastest payment possible. Even if credit card payments could be made after the fact, they are usually not handled online for international transactions.

In addition, obtaining real time card authorization for international transactions online is a major undertaking, because online card processing and bank to bank connectivity does not exist on the Internet in many countries. Also, transactions denominated in most non-G7 currencies are not likely to be processed in real time online because the international banking system is not capable of doing real time, online, Internet currency
15 transactions. Consumers who travel and use credit cards to make payments in other countries, and other currencies, may think these transactions are being handled online, but they are not. Most of the currency exchange processing is done by the connecting banks offline, and most of it that is done electronically is done on private bank and interbank networks.

20 Many of the major credit card issuers also do not allow a merchant to use its merchant

identifier (ID) to process transactions on behalf of related entities. This is a significant problem for mall operators, in particular. To add a new store to the mall, the mall Website operator must ask the store to get its own merchant ID, offline. It can take weeks to get a merchant ID, but without one, the seller in the mall cannot accept any online transactions at all.

For international processing there are other payment methods available, but these are usually done manually or offline. For example, wire transfers allow bank-to-bank payments for international transactions in any tradable currency. However, these are done over private bank networks and usually between companies which have already established a purchasing relationship - - i. e. for MRO or administrative purchasing. Wire transfers are used more often in international trade than company checks, because the processing time for a wire transfer is faster than check processing and the fees charged by the banks are often lower. The participating banks usually handle the currency conversion as part of the process. Again, however, this usually requires some fairly sophisticated interbanking networks in the applicable countries.

Letters of credit (L/C) are another payment vehicle used for international transactions, once they have been negotiated. It usually takes 6 weeks or longer to negotiate one. Negotiations take so long because the issuing bank (the buyer's bank) assumes the total credit risk by agreeing absolutely to pay the seller so long as the transaction documents match the terms of the letter of credit itself. Most disputes about the payment of letters of credit have to do with discrepancies in the L/C terms, including such simple things as

typographical errors. As seen in Figure 2c (Prior Art) heretofore, letters of credit were negotiated primarily by telephone calls and facsimile exchanges between a buyer P1 and a bank P2 which can easily result in both substantive and typographical errors. Banks which process the letters of credit, often use a private network known as the

5 SWIFT system, which provides 128 bit encryption for data sent between points on the SWIFT network. The United States Department of Commerce continues to regulate encryption controls required by US laws, and limits this full level of encryption to US and Canadian banks. Other systems are allowed to use 56 bit encryption outside the US and Canada.

Another form of payment often used by business for production purchasing is known as documentary collection. It is midway between a letter of credit and a wire transfer. With this method, the issuing bank does not assume the absolute credit risk and obligation to pay. It only agrees to assist the transaction as a sort of "honest broker." Consequently, the bank fees are lower. However, this method is normally used between parties that have already established a course of dealing, but want a structured payment vehicle processed through their respective banks.

Still another payment method often used in business transactions is the purchase order (PO) issued against a previously agreed upon master purchase agreement. Some of the MRO or administrative systems which go beyond credit card payments, enable a buyer

20 and seller to use the terms of a previously negotiated master purchase agreement as a governing document for each purchase order issued. In this approach, a purchase order

represents a buyer company's obligation to pay according to the master agreement, and the seller has to accept the risk that the buyer will actually pay the purchase order per the originally negotiated payment terms. As with letters of credit, this form of payment usually involves the transmission of facsimiles and telephone calls between
5 the businesses - an error - prone process.

For purchase orders, as with letters of credit, and similar techniques, one of the difficulties for businesses is known as the "battle of the forms." If a buyer issues a purchase order, or ships goods against a letter of credit with different or additional terms stated or implied, in many jurisdictions it is not clear which contract terms will govern the transaction. Frequently forms get lost, or the exact order and dates of transmission and receipt are not known, or the contents are rendered unreadable by carbon copies or facsimile machines. There is usually no simple, reliable way to track all the steps involved in the transaction. Thus, transactions may be repudiated by buyers or sellers because the paperwork is incomplete or erroneous.

15 While some attempts have been made to address repudiation arising from terms sent fraudulently by other than the authorized buyer or seller, these attempts typically focus on obtaining some form of electronic signature or certificate of authenticity to avoid some of the difficulties. However these do not clear up unreadable terms or track down all the terms negotiation steps.

20 As mentioned above, some existing MRO systems provide MRO application server



software at both the seller's and buyer's sites, which is installed and customized at those sites, to the internal systems used by each- -the cost of such installation and customization is usually high.

In addition to the cost of the internal software installation and customization, enterprise MRO electronic commerce products usually do little or nothing to help a seller find new buyers (or the buyer find better, more cost efficient suppliers) or simplify the initial purchase and multivariate contract negotiation process. Most buyers want to be able to evaluate new suppliers readily. The negotiation of a major purchasing agreement with a new vendor for a new product may take anywhere from 6-12 months or more, if done manually. Since the existing enterprise application server products tend to focus on integrating with existing internal administrative/MRO corporate systems, very little, if anything is done by them to simplify the launching or negotiation of new buyer/seller relationships.

In many corporations, the selection of a new supplier for production purchases usually involves the creation of a team from purchasing, engineering, and manufacturing to evaluate all potential sellers. The team usually flies to potential vendor sites to evaluate capabilities and production facilities, obtain samples, and then return home to evaluate the samples.

For new product developments, the ability to evaluate actual samples as part of the buyer's new product may be critical to the buyer corporation's overall development

strategy and product timetable, and thus, the bottom line. A mass storage device manufacturer that is developing a faster, cheaper, higher capacity disk drive, may need to find high capability read/write heads. Read/write heads with the characteristics needed by the mass storage device manufacturer may not be available from anyone on the market yet. However, the manufacturer probably knows several firms that make high quality read/write heads for existing devices. If these firms have new heads under development, they would usually be willing to provide evaluation samples to such a manufacturer. The manufacturer needs the samples to verify that the new disks it is building will work reliably and at full speed with the heads being developed by the other firm. If these tests can be performed and the results are good, the manufacturer knows it is likely to be able to meet a new product shipment date of x, with a price of y. If samples cannot be obtained and evaluated, the manufacturer's product development cycle may slip by months or years, thus costing potential millions in lost revenues and market shares.

Once a short list of vendors with acceptable samples has been qualified, the team would be represented by the purchasing buyer who negotiates with the different representatives from the vendor short list. When the buyer has selected a seller to buy from, it may still take 6 to 12 months or more to negotiate prices, sales terms, quantities, inspection and replacement terms, availability dates, shipping costs, carrier, risk of loss and insurance, payment options, etc. Most of these terms are critical for production purchasing. The cost of reaching agreement on all terms can come to

thousands or tens of thousands of dollars worth of labor, travel, and other expenses normally associated with the typical production purchase negotiation, in addition to the delays caused to the buyer's development and production cycles.

As another example, if an automobile manufacturer plans to build x thousand new cars and trucks each month on its production line, it needs to be sure that the firm(s) from which it purchases the new types of batteries needed for new models can deliver the required quantity each month, on time, with excellent quality and reasonable prices.

The auto maker could lose millions in sales if its assembly line is stopped because of part shortages. Thus, while price is important in production purchase negotiations, it is only one small part of an overall set of purchase term variables that are strategically important to the auto maker and its cost of goods sold. If the seller uses unreliable shippers and carriers or does not know how to import or export its goods to the manufacturer's assembly plants, the best price on the market will be worth very little to a manufacturer which has to halt production because of missed schedules, shipments, or quantities.

Obtaining samples from vendors known to the production buyer is significant in itself, as seen above. However, in today's international trade, the overwhelming majority of potential buyers and sellers are not aware of each other's existence. Yet international trade is increasing by double digit numbers each year, so an obvious need exists for more capability. Many countries are taking advantage of the "leapfrog" effect by using the Internet and the latest in information technology (IT) to build instant

infrastructures for competing in international commerce. Some countries and trade regions have set up inspection services for potential outside buyers, so that a buyer can obtain an independent assessment of a particular vendor's production facilities from such services. This saves some time and travel expense. However, it still does not
5 provide a buying team with samples for evaluation. With current Internet commerce systems there is no effective way to order such samples. By the time terms and conditions for a sample order have been negotiated manually at such distances, the samples are not likely to be relevant any longer to the buyer company's development goals.

At the same time, most sellers of such products may need time to ramp up their production (especially for new or improved products) in order to meet quantity terms and dates, and they may need to incur additional costs if they have to change shippers to meet the buyer's needs. A seller does not want to have its goods rejected arbitrarily as defective or damaged if this is not the case. So inspection, return and refund policies need to be negotiated. All of these terms are usually variable and may frequently interrelate. If a seller's shipping costs go up - - so might its prices. If a buyer is unable to meet its quantity goals because too many of the seller's goods are defective, the buyer's internal costs go up, and the buyer may have to buy from another source.

Production purchasing negotiations such as these are usually done by telephone, on-
20 site visits, faxes and other non-automated means of conducting a negotiation today.

This work is labor intensive, and if travel is involved, expenses climb. If the transaction

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is an international one between two countries with different currencies, customs, and trade practices, it can take even longer and cost more to conduct the negotiations.

In today's global markets, while international sourcing is becoming more and more important, it is expensive for a buyer team to travel to sites in another country to evaluate them, buy samples for engineering evaluation at home, and to conduct the negotiation through occasional visits between buyer and seller. While most use facsimile machines or computer fax modems to submit drafts of agreements back and forth, face to face negotiations may be needed more frequently for international negotiations, because business practices in the two countries may differ significantly and errors or misreadings caused by poor fax reproductions may further complicate the process.

In other words, application server approaches do not offer any real solutions to the production purchasing, non-retail, problems.

Returning now for a moment to Figure 2b (Prior Art), as mentioned above, Websites such as retail malls or standalone Websites are used by some corporations which sell at retail. While many tools exist to allow companies to design Websites, there are not as many that allow a company to design one for automatic integration into a Website in a mall or with online catalogs. Since most companies want to maintain control over the appearance of their corporate and brand names, those mall or catalog sites that do provide Web tools for their business subscribers, usually do not provide

complete common interfaces or templates for the companies to use, nor do they integrate the sites with multiple features and services. Instead, they usually only provide access to a shopping cart 26 feature and a secure credit card 30 payment feature with a catalog product and price list that is searchable. Some may also provide manual help to the seller in listing its Website in relevant search engines used on the Internet. Normally, however, it is the seller's responsibility to do so. In either case, the registration with search engines is usually done manually. Some may also require the seller to arrange for payment processing separately, offline. As mentioned before, obtaining a merchant ID can take weeks, thus limiting what the seller can do online until then.

Presently, on the Internet, search engines such as Compaq Corporation's ALTAVISTA™, Yahoo corporation's YAHOO™ and so on, have different schedules for accepting and adding new sites to their search lists. It can take anywhere from 4-8 weeks or more for a site to be registered with each search engine. Many Internet search engines also add entries to their lists by "spidering" around the Internet to gather all Website addresses. Depending on the search engine, spidering may take much longer or not be as complete as a user requested registration. For example, ALTAVISTA's Website states:

The Altavista search engine starts by spidering your entire site with its spider Scooter. Scooter may take up to three months to spider and index your entire site. It normally spiders about 2 pages per site in any week. Best bet is to

submit your pages manually at the rate of no more than 30 per week.

As can be seen, the costs to a seller to establish a Website can be significant both in time and money. IDC Corporation reported in 1997 that the average cost of creating a fully enabled domestic US business to business electronic commerce standalone, single, retail Website for a large Fortune 1000 business was approximately \$600,000.00 (Six Hundred Thousand USD.)

BUSINESS MARKETING MAGAZINE™, published by ADVERTISING AGE™, reported in 1998 that median prices for creating a single Website averaged as follows:

Company/Website Size	Average Cost
Small	\$44,500
Medium	\$99,750
Large	\$302,975

To add electronic commerce to the site, costs averaged as follows:

Company/Website Size	Average Cost
Small	\$25,000 (online ordering by fax but no transaction or payment processing)
Medium	\$33,000 (online ordering with credit card processing)

Large \$78,000 (database searches, online ordering, credit card processing)

Creating a single Website can take anywhere from 1-8 weeks to 6-8 months or more. Creating one that is able to handle simple electronic commerce transactions may take
5 even longer as merchant accounts for credit cards need to be obtained, integrating CYBERCASH™ or similar realtime payment methods must be provided for, search engine registrations need to be requested and so on.

As noted above, generally accepted electronic methodologies for handling international commerce online other than on a simple credit card or CYBERCASH™ payment basis for retail sales do not exist. Many countries do not have bank procedures in place to accept international credit card transactions in real time. In such countries, trying to adjust the current banking systems may well be impossible and completely new systems would be needed.

Thus, most existing electronic commerce sites are designed to work with existing
15 proprietary banking networks such as the United States VISA™ and MC MASTERCARD™ real-time card authorization and processing interbanking systems. As noted above, these are known as SWIFT-compatible private networks which use 128 key encryption for security. This often limits a buyer or seller's market potential unnecessarily. Since many countries do not have banking systems comparable to the

SWIFT interbanking system, payments in such countries may only be made by manually negotiated letters of credit and so on. It can take from 4-6 weeks simply to negotiate the terms of a letter of credit, when using the same manual techniques of phone calls and fax machines. In a global economy, when manufacturers in one country may want to source parts and components from the Pacific rim, sell them in the United States, Europe or South America, or Pacific Rim, a system that does not address the complexities of international purchasing is very limiting.

Similarly, the companies that provide Web hosting for a mall 24 on the Internet as shown in Figure 2b (Prior Art) usually address only retail sales of consumer articles, with little or no control over the individual businesses that subscribe as sellers or the consumers who browse as buyers. In many business transactions, buyers want to know that the sellers meet some minimum standards and requirements and sellers want to know that fraudulent or inappropriate requests will not be tolerated.

Most World Wide Web mall or commerce sites do not offer this kind of site integrity for their business transactions, since most of them are directed primarily to retail sales in which a consumer can usually rely on consumer protection laws and some credit card "insurance" practices, for protection from the unscrupulous.

The few enterprise electronic commerce providers that go beyond the mall concept do so with the addition of a governor or administrator feature which coordinates with the enterprise application servers. The governor sets up and administers the rules for the

site and can act as a broker. This usually entails a customized, specially programmed matching of participating companies' computer systems to coordinate authorization and payment approval so orders flow between firms. However, this technology can cost millions and it can take as much as two years to program the computers and set up the necessary processes and equipment at all the participating company sites. Most of the components for doing this are sold by major computer hardware and software vendors who also sell application server software, hardware, and consulting services to install the "front-end" application server at the participating business's site. Thus, while the Internet may be used to connect the companies participating, most of the work is done by the application server software installed on private, proprietary networks at the various company sites, and the Internet serves as a simple external telecommunications link.

Another complication of some of the seller - centric and enterprise application server products designed for commerce is that they may only work with certain forms of electronic data interchange (EDI) technology, which is 7 to 10 times more costly to use than other methods. Existing EDI technologies use private networks and charge per call and by the bit of information transmitted. Depending on the approach used attempting to change such systems to use other forms of data interchange can be very costly, because of the number of installed software application servers at the participating company sites which must be radically changed. Because of the expense associated with most EDI technologies, only about 2% of companies worldwide attempting to do business over a network use them.

Existing business to business enterprise application software servers tend to have more of a sellers' focus, and, as mentioned above, they tend not to focus on a buyer's need for finding and evaluating new sellers, nor for negotiating and bargaining with the new suppliers. Similarly, most of the mall Websites which focus on retail sales are seller-
5 centric. That is, they focus on letting a seller list its wares and prices, and decide how much to disclose about itself and its products and only allow the buyer to select from listed items and prices. Little or no seller marketing, product, terms or service evaluation information is available to the buyer. As mentioned before, a buyer on a mall Website is usually not permitted to negotiate anything, simply to select from prices and payment options provided by the seller. Buyers using the enterprise application server software products cannot use them to negotiate new production purchases, but simply to process maintenance, repair or operation (MRO) orders against existing, already negotiated agreements.

Even with the seller-centric focus, most companies that provide a mall or enterprise
15 application server business to business site offering, do not help with the marketing or promotion of the participating sellers' brands. Thus, the value of these services for the participants are often limited by the power of each company's individual brand. If the seller participants have products that are not well-recognized by brand name, an electronic commerce mall or business to business enterprise application server software
20 service usually does not provide much added visibility or market reach. A few sites have attempted to address this by organizing along vertical market segments, such as

mall devoted to the steel industry, but this alone does not provide that much additional visibility, primarily because it does not address some of the basic needs a buyer has for multivariate negotiations.

5 The production purchasing buyer needs to be able to collect information about sellers, and it would help to know that some entity has screened them and monitors them for adherence to some known set of standards and reputability. Additionally, production buyers today usually have to travel to a seller's physical location to get sample products. If the buyer is in the US and the seller is in Malaysia, this might cost thousands of dollars in airfares and travel expenses, just to get samples. Most existing products and services do not help with these tasks. As noted above, samples of newly engineered component parts may be critical for the buyer company's completion of its product. New systems being built by a computer maker may need power supplies or heat dissipation systems that are also new and unproven. The engineers developing the new computer systems need to be able to test their prototypes with sample, new component parts to know the whole system will work. None of the existing methods of buying over the Internet address this kind of need. Most systems are not designed from the buyer's viewpoint.

One system does attempt to address a few things from a buyer's viewpoint. This is the Priceline.com system which is described in US Patent No. 5,794,207 Method and
20 Apparatus for a Cryptographically Assisted commercial Network System Designed to Facilitate Buyer-driven Conditional Purchase Offers, issued Aug. 11, 1998, to Walker et



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However, since very little is offered in the way of iterative bargaining, other than a simple order/confirmation process, little or nothing is known, and consequently stored

about the negotiation process on a step by step basis. Again, any information that is collected is likely to be of interest primarily to the seller, not the buyer, since most of the systems in existence are focused on the seller.

Once a complex agreement has been negotiated, printed in hard copy, and signed, it usually goes into a file system and in frequent cases virtually disappears. Six months or a year after signing, the parties to the agreement may have re-organized their companies or promoted the people involved in the original negotiation, so that new people are assigned to administer the agreement and carry on the relationship. Often times, the new individuals do not follow the agreement completely and sometimes it even gets lost in the transitions that so many companies undergo today. Thus many of the benefits that were obtained through long and hard negotiations may be lost over time.

Similarly, relying primarily on a hard copy paper trail to manually validate orders placed against an agreement is error prone. If the agreement is lost or only infrequently referred to, validation begins to erode, and correspondingly, so does the likelihood that all the benefits will be obtained. For example, additional discounts for timely order placement may be lost if the successors are not aware of the discounts.

To attempt to maintain file copies of the agreement in several different departments within a company also leaves room for error with present techniques. While the legal department may have the official copies, marketing, purchasing, engineering and

manufacturing may not be as rigorous at filing and may be working from copies of the next to the last draft, or may lose copies of formal amendments.

For many companies it is important that a major agreement be available and understood by several departments. Using the example of discounts for early order placement and lack of reorders and corrections, it may be important for engineering, purchasing and manufacturing to coordinate their efforts to take advantage of this. For the design of a new product, engineering is usually responsible for determining the exact kind of components to order, while marketing, purchasing and manufacturing may need to cooperate to plan a schedule for ordering in quantities over time. While there are some systems that allow an engineering design to be turned into a parts list, there are no systems that allow an agreement to be used to inform the whole process.

Similarly, a major agreement usually involves at least two entities. Short of costly, time consuming options such as litigation or mediation, there is little available today that such entities can use to manage the agreement and the ensuing relationship it creates between them. While there are some automated systems that allow one company to place orders against a manually negotiated agreement, these systems do nothing but that. Many companies do not want to extend such a system further into their internal networks for fear of disclosing sensitive material such as pricing information, customer lists, or new technical developments.

In many industries, developments in the legal system such as the Uniform Commercial

Code and IncoTerms, coupled with experience in the industry, make it easier to develop model "Standard Agreements" that companies can use as a starting point for negotiation. For the most part, however, the only way these have been used is as the basis for word processing text.

- 5 The problems associated with complex commercial negotiations are similar to those found in complex design, development and production environments. In fact, many design, development and manufacturing processes require a significant amount of negotiation.

A customer, such as a computer manufacturer, may want to include a scanner product made by a scanner manufacturer as an integral part of its new computer system. After completing the scanner vendor selection and contract negotiations process, the customer typically still faces a number of iterative negotiations with the maker of the selected scanner subsystem--however, these may have to do with the design, the development and even the manufacturing of the subsystem. For example, the
15 computer manufacturer may want the scanner vendor to develop custom driver software for each of the three operating systems the computer manufacturer uses, and may want special features in each. The scanner vendor may be unexpectedly limited in resources and time, thus requiring that the computer maker make some selection and priority decisions. Each party may have to go back and forth numerous times with
20 requirements documents, design documents and development timetables until a good result is achieved at each stage of the development process.

Presently, there are custom development tools developed for internal use by a supplier in specific industries, such as rapid prototyping systems for Very Large Scale Integrated (VLSI) integrated circuit chip makers, but no systems that address the ongoing negotiations between customers and suppliers that actually take place in complex design, development and production processes.

As companies and legal entities operate in the present economy, it becomes increasingly important for them to identify their respective core competencies and separate them from other processes that are done internally but may not be essential for the business. For example, a computer manufacturer may have hardware design and engineering as its core competency. Logistics management for shipping and receiving may not be a core competency, yet it may still be done internally. At present there are few analytical tools a company can use to examine its internal processes to see which are most effective and which need improvement or need to be subcontracted out. There are some consultants who will study such processes manually, and some decision support tools available, as well as the beginning of a concept called collaborative forecasting and replenishing which attempts to allow two companies to compare their respective processes. However, there is presently no automated infrastructure that can be used by consultants or systems to do this.

SUMMARY OF THE INVENTION

An process mining system for analyzing the processes used to implement negotiated contracts and other agreements stored in an automated system of record. Using unique identifiers assigned by the contract authority of the invention, process mining
5 can be done to evaluate the effectiveness of processes used to implement one or more sets of negotiations.

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BRIEF DESCRIPTIONS OF THE DRAWINGS

Figure 1a is a block diagram of the present invention showing its use by one sponsored commerce community.

Figure 1b is a block diagram of a configuration of the present invention.

- 5 Figure 1c is a logical diagram showing several communities created using the present invention.

Figure 1d is a block diagram of the present invention showing its main functions.

Figure 1e is a block diagram illustrating a main process of the present invention.

Figure 1f is a block diagram illustrating database structures of the present invention.

Figure 1g is a block diagram showing some of the main interactions enabled by the present invention.

Figure 1h is a schematic drawing of a multi-media embodiment of the present invention.

Figure 1i is a flow diagram of the multivariate negotiations engine of the present invention.

Figure 1j is a block diagram of sponsor functions of the present invention.

Figure 1k is a block diagram of participant functions of the present invention.

Figure 1L is a block diagram of network functions of the present invention.

Figure 1m is a block diagram of external functions of the present invention.

- 20 Figure 1n is a block diagram of database functions of the present invention.

Figure 1o is a block diagram logical overview of database functions of the present invention.

Figure 2a (Prior Art) is a block diagram of a prior art enterprise application software

server system.

Figure 2b (Prior Art) is a block diagram of a prior art Internet mall site.

Figure 2c (Prior Art) is a block diagram of prior art sample quantity purchasing techniques.

5 Figure 3 is block diagram of a type of community enabled by the present invention.

Figure 4a is a flow diagram of remote Web authoring of the present invention.

Figure 4b is a flow diagram of the customization of the remote Web authoring of the present invention.

Figure 5a is a block diagram of the database functions of the present invention.

Figure 5b is a block diagram of a database entry of the present invention.

Figure 6 is a flow diagram of illustrative sponsor promotion activities of the present invention.

Figure 7 is a flow diagram illustrating a buyer entering negotiations.

Figure 8 is a flow diagram of illustrative reporting features of the present invention.

Figure 9 is a flow diagram illustrating a buyer participant's preparation for purchasing.

Figures 10-1 through 10-3 are schematic diagrams of interactive Web authoring screens of the present invention.

Figures 11a-1 through 11a-3 show a completed letter of credit negotiated using the present invention.

20 Figure 11b is a sample email notification of the present invention.

Figure 12 is a block diagram of a seller's administrative database of the present invention.

Figure 13 is an illustrative block diagram of a database entry for a community sponsor,

showing status of a negotiation.

Figure 14 is a block diagram of another sponsor administrative area of the present invention.

Figure 15 a is a block diagram of part of a seller's order processing using the present invention.

Figure 15b is a block diagram illustrating a buyer's proposed terms using the present invention.

Figures 15c-1 through 15c-3 are block diagrams showing a proposed letter of credit using the present invention.

Figure 16 is a block diagram of a seller's view of a proposed order with payment by letter of credit using the present invention.

Figure 17 is a block diagram illustrating seller's order processing using the present invention.

Figures 18-23 are illustrative e-mail notifications of the present invention.

Figure 24 is a block diagram of an illustrative set of community rules using the present invention.

Figure 25 is a flow diagram of the present invention's automation of search engine submissions.

Figure 26 is a flow diagram of a customizable language process for remote web authoring of the present invention.

Figure 27 is a block diagram illustrating International transaction processing using the present invention.

Figure 28 is a block diagram showing records archived by the present invention.

Figure 30 is a block diagram showing a wire transfer negotiated according to the method and apparatus of the present invention.

Figures 31a through 31d are block diagrams of remotely authored Web pages created using the present invention.

Figure 32 is a block diagram showing sample quantity ordering with the present invention.

Figures 33-37 are block diagrams of an automated system of record of the present invention.

Figure 38 is a block diagram of a logic overflow of the invention.

Figure 39 is a table showing the use of a unique identifier in the present invention.

Figures 40 and 41 are block diagrams illustrating active templates of the present invention.

Figure 42 is a block diagram of an interactive technical development using the present invention.

Figures 43 -51 are flow diagrams of the invention.

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DETAILED DESCRIPTION OF THE INVENTION

Overview

In Figure 1a, a block diagram of the present invention shows a multivariate negotiations engine system 02 communicating over telecommunications link 10a to the Internet 04. A community sponsor 06 is shown also communicating over a telecommunications link 10b to the Internet 04. Participants 08 in this community are shown at 08a-08h. For commercial implementations each participant is either a buyer or a seller (or in some cases, both) in the community. Participants 08 connect to community sponsor 06, through the Internet 04 and multivariate negotiations engine system 02. Multivariate negotiations engine system 02 contains all the software needed to create sponsored communities, communicate with sponsors, and with all participants and store the results. Each sponsor or participant only needs a standard Internet browser such as those commonly available from Netscape Corporation or Microsoft Corporation, among others, and a commonly available desktop computer or other terminal, workstation, or computer to activate the browser over any commonly available link to the Internet. Typically, these browsers are distributed free of charge by their suppliers.

Multivariate negotiations engine system 02 can be used for other types of sponsored communities where interactive, iterative negotiations of a number of interrelated, variable items amongst the participants over the Internet is desired.

For example, manufacturers in the computer industry might want to agree on a set of

multi-part, multi-tiered industry standards for a new computer bus. A computer industry association or a standards association might be the community sponsor, and the computer and peripheral manufacturers might be the participants who need to iteratively negotiate with each other and/or the standards body to agree upon the standards. The sponsoring standards body establishes the community, proposes initial standards, sets the rules for negotiations, encourages and monitors negotiations, and concludes with a finally agreed upon set of standards, with each step of each negotiation that occurred along the way archived. Since no additional hardware or software needs to be installed at the sponsor's site or at those of any of the participants, the present invention provides a much more economical and speedy way to negotiate complex, multivariate items such as complex standards specifications.

Additionally, while one form of sponsored community addresses corporate buyers and sellers engaged in production purchasing, other commerce communities could be implemented. For example, stock or commodity trading over the Internet might be conducted using the present invention. A sponsor, such as a traditional stock exchange or a newer type of securities body could establish the standards for accepting stockbrokers into the community. Such standards might include compliance with applicable securities regulations and so on. The sponsor can monitor and regulate actual iterative multivariate negotiations such as options, puts, calls, at the market or not at the market, etc., for buying and selling of commodities or securities electronically over the Internet. Or a trade show organizer might sponsor a community for allocating and iteratively negotiating accommodations, placement,

42

footage, signage, facilities, etc., amongst vendors and suppliers at the show site.

Participants in a community can also ask the sponsor to appoint a moderator for their negotiations, if stumbling blocks arise. The moderator can monitor the negotiations and suggest next steps at any time in the process to one or several of the participants.

- 5 Many other types of communities can be created with the present invention. For example, governmental agencies might sponsor trade commerce communities for regional trade development efforts. International organizations might sponsor a community to assist countries in negotiating complex treaties.

Commonly available video conferencing and other multi-media techniques can be added to multivariate negotiations engine system 02. For these embodiments, it is possible that both sponsors and participants would have to add hardware or software for the multi-media features at their sites, if such features are not already present.

Figure 1h illustrates the use of commonly available videoconferencing equipment such as a camera positioned at the top of a monitor connected to a simple desktop

- 15 computer. With existing videoconferencing products, an image I1 of a participant at another site is displayed on the monitor at the same time the Web browser interface W1 to multivariate negotiations engine system 02 displays a list of the terms being negotiated. Those skilled in the art appreciate that most existing videoconferencing products also include voice communications as well. Thus, the negotiating participants
20 can see and hear each other and the complex, multiple variables they are negotiating at

the same time. Multivariate negotiations engine system 02 can archive the multimedia sessions as video and audio files to be stored with the text.

The present invention allows the creation of one or more sponsored communities of any number of types for conducting iterative negotiations over a network. As seen in Figure 1a, the network used is the present-day Internet with TCP-IP protocols and formats, but those skilled in the art will appreciate that it could also be implemented on any future open network(s) which might replace or supplement the Internet, or it could be implemented inside current, private networks within a corporation, if desired.

Turning now to Figure 1c, a logical diagram of several different sponsored communities is shown. Sponsored community CA might be a community of farm equipment buyers and sellers, while sponsored community CC might be a community of stockbrokers CC08br and traders CC08tr. Sponsored community CB might include computer manufacturers CB08m and peripheral makers CB08p in a standards community CB. Existing enterprise electronic commerce systems would require each member of such a community to install special Webserver, application server and database server software at each sponsor site, and at all or some participant sites in a community such as sponsored community CC. The present invention, however only requires that each sponsor, and participant in a community have a standard Web browser (not shown here), and a connection to the Internet 04. All of the processing software and hardware needed to handle transactions for each community CA-CC shown here is provided at the multivariate negotiations engine system 02's site.

The above aspect of the present invention is particularly important in business to business negotiations. Use of the Internet architecture helps both sponsors and participants keep their separate brand identifications through their individual URLs and Websites, and the use of http addressing and protocols enables near-instantaneous
5 pulling of text and object files in response to any queries, whether in the same country or around the world.

Now in Figure 1f, in many cases, sponsor 06 database 225 will be perceived by the participants and any visitors to the site, as the general site database for the sponsored community. In this capacity, the present invention includes site services such as
10 collecting data on the number of visitors to the site, their demographics, and maintaining similar server logs and analysis of the site traffic.

Now turning to Figure 1g, the present invention can be viewed as a series of interrelated processes as shown here. For a commercial community, there are seller processes, sponsor processes and buyer processes. Remote authoring 50, is a seller
15 process which enables a registered seller in the community to create a seller Website within the community on which to include the seller's marketing and product information, along with pricing, terms, service offerings and so on. Information generated or created in this remote authoring process 50 is automatically integrated with the community databases and listings. Promotion and brand identifying actions

(such as registering the Web page with search engines) are taken automatically on behalf of the seller as well.

Still in Figure 1g, a seller, once registered and having completed remote Web authoring, can immediately evaluate orders 54 and other inquiries and respond to them. The present invention alerts sellers (and buyers) that a pending offer or counteroffer has been submitted, so that they may return to the system to negotiate or resume negotiations. Finally, another seller process is order activity 58 which allows the seller to follow the activity by e-mail or browser or similar means, and request data downloads or activity reports on transaction data.

The sponsor processes of Figure 1g include maintaining databases, registering community and seller domain names, and submitting Web uniform resource locators (URLs) to multiple search engines so that both the community Website and each seller Website within it can be found by search engines such as Compaq's ALTAVISTA™ among others. Sponsor 06 also monitors activity, collects fees, establishes standards or rules (or both) for the community, and promotes successes. Once a deal is concluded it is archived 68, by multivariate negotiations engine 212 on behalf of seller. The present invention also allows the collection and analysis of direct e-mail demographic information, such as company name, title and location. This data helps the present invention screen out frivolous or fraudulent inquirers. For example, a high school student attempting to propose an order might be intercepted when the present

invention determines that no company name or title has been provided and no other authorization for such a request has been provided for.

Buyer processes shown in Figure 1g include search and evaluate processes 70, which enable a prospective buyer to find companies and their products in the community and investigate their prices, terms and service offerings. If a buyer is interested in opening negotiations with a particular seller, the proposed orders processes can be based on catalog prices or desired price and other terms, special orders for samples or small quantities, proposed payment vehicles, and can include information about the buyer. A buyer in this community can use order activity processes 78 to determine an order's status in the system, etc. Note that access to relevant information by each type of community member (sponsor, buyer, seller) is protected by password security and access levels.

Turning now to Figure 1k participant functions 214 are outlined. In a commerce community, the participants might be grouped as sellers 08grpa and buyers 08grpb.

Seller participant 08grpa functions include automatically integrated remote Web authoring 214-02 and processing and administration 214-04. In remote Web authoring 214-02, the present invention allows a seller registering with the sponsored community, to automatically create a seller's Website within the community, on completion of registration. The seller selects from several Website format templates provided by the present invention and as the seller "fills in the blanks" in a selected

template, the information is automatically integrated with the rest of the system, so that orders can be processed and accepted immediately and more efficient registration with search engines is automatically initiated. A seller's processing and administrative steps 214-04 includes such tasks as uploading product catalogs, customizing the Website from
5 time to time, and similar processing.

Still in Figure 1k, participant functions for buyer participants 08grpb could be as simple as proposals 214-10. A buyer might either propose negotiations of order terms based on a seller's catalog and price lists or send out a request for proposal (RFP) to all or some of the seller's in the community, or send out a request for a quote (RFQ) to all or some of the sellers in a community, asking sellers to respond with the best, most comprehensive terms each seller can offer. The present invention also provides prospective buyers with the ability to make e-mail inquiries through the system, which are logged by the system.

Next, in Figure 1L, network functions 207 of the present invention are shown. As
15 mentioned above, most of the functions of multivariate negotiations engine 212 are actually implemented as part of Webserver software 210s. As data is sent to and from the Internet 04 by Webserver 210W, Webserver software 210s interprets the TCP-IP protocol and transfers the contents to multivariate negotiations engine 212's Webserver and dynamic HTML functions 207-02. In one embodiment, these functions
20 cause dynamic HTML text to be created to implement and communicate with the other functions of the present invention. Those skilled in the art will appreciate that Java, Java

scripting , XML, or any of a number of other languages could also be used for such communications.

Figure 1m, shows the external functions 211 of the present invention. Reporting 211-02 is one type of external function 211. When participants have concluded a negotiation, one or both of them may wish to have the final documents and current status of the deal reported back to them. The present invention protects the documents with separate user names, passwords and access levels for each inquirer. That is, a sponsor may be able to see the broadest or deepest levels of a transaction in the community using its master user name and password. A seller may be able to see all transactions relevant to it, proposed orders pending for it from one or all members of the community, using sellers own user id and password. A buyer may only be able to see orders it has proposed or concluded with one or all members of the community, using buyers separate user name and password.

Another external function 211 of the present invention shown in Figure 1m, is the ability to incorporate application programming interfaces (API's) 211-04. Since the present invention is designed from the "outside looking in" (from the network looking into the enterprise) as it were, the data from transactions completed using it might have to be transferred manually to internal seller and buyer system formats without API 211-04 functions. With API 211-04 functions, the data that is stored internally by the present invention, can be reformatted by an API designed for a particular seller or buyer's internal systems. For example, if a seller has accepted all the terms of an open

buying agreement against which a buyer has now placed an order, the seller might use an API 211-04 to "translate" that data into a format the seller's internal ERP systems can accept for order processing. For many participants and sponsors, standard APIs 211-04 can be created to interface with standard internal ERP systems, such as ORACLE or SAP Corporations' databases and so on. For other participants and sponsors, custom API's may need to be created to interface the present invention with their existing internal systems. In all cases, however, no API's are required to enable sponsors and participants to use the services provided by multivariate negotiations engine 212.

Now turning to Figure 1n, database functions 222 are shown. First, database functions 222 are able to communicate with all other functions and services of the present invention and vice-versa. For example, as a remote Web authoring 214-02 request is handled by participant functions 214, Webserver software 210s fields the request and communicates it through IP firewall 203 f to database functions 222, asking the database server software managing database functions 222 to process the request and return the appropriate information. The database server software performs searches, analysis, and any computations needed to hand back the correct data. Webserver software 210s formats the returned data, and through conventional common gateway interface scripting techniques, creates dynamic HTML (or XML or Java or Java-compatible, etc.) text for ultimate display. This formatted data, in turn, is transmitted to the appropriate sponsor or participants' browsers over the Internet.

Unique id's feature 222-02 is used to insure the proper data is found and transmitted.

That is, the present invention associates unique identifiers (id's) with each sponsor, participant, and type of data or transaction. Since database functions 222 are integrated directly with the other functions of the invention, faster processing and updating of the database is enabled.

- 5 Figure 10 shows a logical diagram of the relational structuring of database (s) 225 created according to the method and apparatus of the present invention. As seen here, logical folders, such as 06f, 08s1f, and 08b1f, are created for the sponsor 06 and for participants. A seller folder 08s1f is referenced from sponsor 06's community database folders 06f, and from a buyer's folders 08b1f. Databases 225 created according to the present invention use a combination of record, field, relational names and delimiters to interrelate the elements within. Those skilled in the art of relational databases will appreciate that a number of additional references and folders can be interrelated.

System

- Turning to Figure 1b, multivariate negotiations engine system 02's site contains all the software, hardware and database functions to create and support complete operations of communities. As seen there, the multivariate negotiations engine system 02's Website has a Webserver 210w containing standard Webserver software. In one embodiment the public domain Apache Webserver software is used, but those skilled in the art will appreciate that any of a number of other Webserver software products could be used, such as that provided by Microsoft Corporation's Internet Information
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- 20

Server (IIS) product or Netscape Corporation's Fasttrack or Enterprise Server products or any of several of UNIX™ Operating system server software products available from many vendors.

Still in Figure 1b, Webserver 210w enables communications in the TCP-IP format, to be received from the Internet 04 and forwarded into multivariate negotiations engine system 02's site, which is here shown including server farm 230. Data in these communications is transferred through IP firewall 203f. Those skilled in the art will appreciate that IP firewalls, that is, firewalls such as those supplied by RAPTOR™ IP firewalls from Axent Technology Corporation, SOLSTICE 1™ and SOLSTICE 2™ IP firewalls from Sun Microsystems, Inc., and PIX™ Firewalls 510 and 520 from Cisco Systems, Inc. among others, are capable of screening the incoming and outgoing information at all the levels of the TCP-IP OSI 7-layer model. Thus they provide greater security than simpler router or proxy server firewall approaches. Webserver 210w, also transmits out to Internet 04, when transmissions are sent out from multivariate negotiations engine system 02's site. Thus, the data about negotiations and transactions in a community is kept safe behind IP firewall 203f at multivariate negotiations engine system 02's site. Data is kept secure by IP firewall 203f and communications over the Internet 04 are kept secure by Secure Socket Layer (SSL) encryptions.

Returning to Figure 1a, all the components of multivariate negotiations engine system 02 are installed at a site separate from any sponsor 06 or participant 08 sites. This eliminates the need for any installation of software at a sponsor 06 or participant 08's

site or the need for any customizing of software at those sites, thus greatly reducing the associated installation, customizing and training costs that either the sponsor or the participants or both might have incurred with other systems.

As will be apparent to those skilled in the art, if a sponsor or a participant wishes to have some of the applicable system software installed locally, this can also be done. A sponsor 06, for example, may have already spent half a million dollars or more creating its own Website and would prefer to operate the community from there. This can be accomplished with the present invention by installing the invention's core libraries on the sponsor's Webserver just as it is installed at multivariate negotiations engine system 02's site. A sponsor desiring such local installation would usually require a firewall and database server locally, too, dedicated to the community. Once these are in place the present invention can be installed at the sponsor's site in the same way it is installed at multivariate negotiations engine system 02's site. Depending on the configuration desired by the sponsor for the local site, additional customization may be required.

While the ability to operate the community from a sponsor's existing local Website is thus available, it is likely to be more costly to install than simply using the services provided at multivariate negotiations engine system 02's site.

Similarly, a seller may wish to use a Website it has previously created at great expense. Multivariate negotiations engine system 02 enables this by providing a customizable scripting language as shown in Figure 26, and described in more detail below. Using

this language, multivariate negotiations engine system 02 helps a seller create a Website which is, in effect, a mirror of the seller's original Website. A seller might choose to place its product catalog there and have the rest of its Website remain external to multivariate negotiations engine system 02's site. Thus, the existing seller external
5 Website retains its existing domain name and URL, is linked to by the present invention as described above, and requests to see the product catalog are linked back to multivariate negotiations engine system 02's site where the product catalog is kept.

A more detailed view of multivariate negotiations engine system 02's site is shown in Figure 1d. As seen there, the Website 200 includes Webserver hardware 210w, IP firewall 203f, server farm 230 and database server hardware 220. As shown in Figure 1d, most of the functions needed to implement the present invention are implemented outside IP firewall 203f as part of the Webserver software used with Webserver hardware 210w. In this embodiment, the database server software 222 and the data 225 are the only items behind IP firewall 203f. Those skilled in the art will appreciate that all of multivariate negotiations engine system 02's functions could also be placed behind a firewall if virtual private networks (VPN) or tunneling or similar techniques known in the art used for implementation.

Still in Figure 1d, the principal functions of the present invention operate as part of Webserver software 210s executing in Webserver hardware 210w. Multivariate
20 negotiations engine 212 is the central function, with sponsor functions 213, participant functions 214, external functions 211 and network functions 207 working in cooperation

with it. All of these, in turn, communicate through the IP firewall 203f, to database functions 222, operating with database server system 220, to maintain database(s) 225. Security of sponsor and participants' communications is provided at the Webserver level through secured socket layer (SSL) encryption schemes offered by most

5 Webserver software products, while an additional layer of security is provided by restricting access to database server computers 230, where databases 225 resides, by use of IP firewall 203f. Thus, the present invention enables the collection and storing of negotiations and results data in a highly secure hosting environment over a public network.

Figure 1i is a flow diagram of the steps of iterative multivariate negotiations engine 212 of the present invention. At step 212-02 an initializing event occurs, such as participant 08 proposing terms to another participant on an initiating terminal (or desktop computer or workstation, etc.) over the Internet 04 through multivariate negotiations engine system 02, thereby creating a communications path which is ultimately directed by multivariate negotiations engine system 02 over the Internet 04 to the destination terminal at which the selected other participant 08 is active. The terms could be the placement of an order from a buyer, or a seller's response to a general request for proposal (RFP), and so on. In initializing step 212-02 multivariate negotiations engine 212 recognizes that these two participants are negotiators and also

20 determines that a deciding entity has been appointed either by the sponsor or by the rules established for this community.

For simple order processing, the seller may be designated the deciding entity by default. For an RFP, the buyer might be designated the deciding entity. In non-commercial communities, such as standards communities or treaty negotiation communities, a sponsor 06 may wish to designate multiple deciding entities for each
5 issue under consideration. In such an implementation, a sponsor 06 will usually want to establish more detailed rules for the ordering and processing of proposals.

Still in Figure 1i, the next step 212-04 is a statement of multiple terms by one of the negotiating participants. The terms could be formatted in any of a number of ways, such as pre-formatted forms, open field boxes, text areas, and so on. [See Figure 15b, for example] At step 212-04, the proposed terms are evaluated by the other participant. If the other participant is also the deciding entity and the terms are accepted, the last set of terms proposed is stored and processing proceeds to step 212-08, closure.

However, if the terms are not accepted, multivariate negotiations engine 212 stores this set of proposed terms at step 212-10 and processing loops back up to step 212-04, where
15 terms are proposed again, usually with some variations from the previous set proposed. This iterative process continues between steps 212-04 and 212-10 until the deciding entity accepts the terms and closure is reached at step 212-08. Multivariate negotiations engine 212 keeps track of each set of changes and can display them so that the changes proposed at each step of the negotiations are clearly and accurately
20 recorded.

Still in Figure 1i, once closure is reached at step 212-08, multivariate negotiations engine 212 checks to see if a concluding document is desired. For most transactions in most communities, some form of final document (such as contract document 242 above) is desired to reflect the participants' agreement. However, it is possible that the participants may only wish to reach closure and that they will rely on the recorded rounds of negotiation to memorialize the terms they agreed on. If a concluding document is requested, it is created and noted as complete at step 212-04. Whether or not a concluding document is requested, the system automatically displays the changes so they can be easily seen and the present invention also checks to see whether a state change is needed at step 212-16. If a state change is needed it is initiated at step 212-20. Depending on the community, the participants, and the transactions involved, state changes could be as simple as payment authorizations sent electronically or as complex as multi-step processes desired by the participants.

Also as mentioned above, API functions can be used to integrate the present invention with a seller's or buyer's internal ERP systems, if desired.

While some users of the present invention may want to install parts of it locally, it is another advantage of the present invention that it can also be used for a "one-time" or "nearly instantaneous" community negotiation. Turning briefly to Figure 1c, if the sponsor of community CB is a standards body, it could create a community Website for the negotiation of a particular standard, enlist participants, and encourage and monitor the negotiations without anyone having to buy or install additional local hardware or

software. When the negotiation is complete and the concluding agreed upon standards document can be made available to all concerned, the community could be "dismantled" and the participants could disband without wasting any hardware or software installations and expenses. In other words, the present invention could be operated as a one-time service for a fee, as well as an ongoing systems. In either case, the costs of the system's fees are likely to be dwarfed by the costs the users would otherwise have incurred if they had to create their own Websites and mechanisms.

Iterative multivariate negotiations.

With reference now to Figure 1e, the steps of multivariate negotiations engine 212 are shown. While a sponsor 06, is desirable, multivariate negotiations engine 212 can operate with only a deciding entity DE and another initiating entity OE. If this is a commerce community, deciding entity DE is usually the seller and the other initiating entity OE is usually the buyer. However, even in this situation, other designations are possible. For example, if the buyer is sending out a request for proposal to which sellers must reply and negotiate, then the buyer may be the deciding entity and the seller(s) the other negotiating entity. For many master agreements or open to buy agreements, both negotiating parties may be deciding negotiating entities.

In any case, as described in more detail below, one of the entities initiates a negotiation process and the participants negotiate terms iteratively, back and forth through multivariate negotiations engine 212 until the deciding entity accepts and closure 240 is reached. In a commercial community, closure 240 usually results in a contract

document 242 and probably some state changes 244 associated with activating production, shipments, payments, order handling and so on.

To operate, multivariate negotiations engine 212 shown in Figure 1e, need involve only two entities, one with decision-making authority and one to propose different or additional terms, with the goal of their actions being closure on a final set of terms. Multivariate negotiations engine 212 can also help participants check out market conditions through inquiries and proposals where closure 240 may not result in any contract document 242 but only in an accurate assessment of market conditions. For example, when there is rumored to be a shortage of goods of a certain type, a buyer may want to know whether it can purchase such a product in high quantities at a reasonable price from any seller. If not, then the buyer may believe the shortage does, in fact, exist.

Returning now to Figure 1e, it can be seen that as few as two participants can use the iterative multivariate negotiation features of the present invention. At least one must be designated or identified as the deciding entity DE. Both can propose terms back and forth (see Figure 1i) until closure 240 is reached.

Now referring to Figure 15b, a typical proposal form for a buyer is shown. As seen here, the buyer identifies himself, his title, his company, and the company's location at lines 332-342. At lines 344-350 information about the buyer's designated freight forwarder is given. At line 350, document presentation terms are specified, as well as at

line 352, 354, 358 and so on, the detailed terms of the buyer's preferences for shipment.

Note that at box 362, buyer's comments, the buyer has said "I want a 20% discount."

Open text box 366 can be used by the buyer to type in or cut and paste in from another document any additional terms the buyer would like to see. This might include

5 warranty and indemnity terms favorable to the buyer, provisions for acts of God, and so on. If purchase orders of bulk order terms are being negotiated they can be included here. Letter of Credit (L/C) or other internationally standard payment vehicle terms such as wire transfer, documentary collection are being proposed, the negotiation can be structured around them.

Once the buyer has sent its proposal, the seller is alerted by the system by email (as seen in Figure 20) that a proposal is available on the system for review and negotiation.

In one embodiment, the email notification includes links to multivariate negotiations engine system 02's site. Once the seller (using its browser) becomes aware from the e-mail that a proposal is available it jumps immediately, using the link mentioned above in the email, to view a browser screen such as that shown in Figure 16, which shows a proposed order with payment by letter of credit from the above buyer. According to the present invention, the seller must still use its user id and password for such viewing, thus preserving security of the data. In this approach, the email notification does not contain any sensitive or confidential data. It serves simply as a notifier. Note that email
20 notices of the present invention do not contain any confidential information.

Confidential data is transmitted securely to the browser through SSL techniques. Access to the data is by user name and password.

All participants in a negotiation are continually notified by e-mail as the negotiations progress. In this embodiment, the participants are required to enter their e-mail addresses in order to use the present invention. When participants log into their protected areas in the system's databases 225, they are also presented with information regarding the latest developments, if any, which have occurred in their respective negotiations.

International Transaction Processing

One of the paradoxes of international trade now is that as today's global economy expands exponentially the number of potential buyers and sellers, it becomes correspondingly difficult for them to find each other and negotiate agreements. The present invention addresses this in a number of ways. First, a sponsored community increases the visibility of member companies which are sellers. The methods described below in connection with functions to promote visibility for the sponsored community and its members significantly increase the likelihood that a buyer, searching for a new supplier over the Internet will find members of such sponsored communities and that they will be more likely to meet the buyer's needs. For example, trade development communities can be established using the present invention, including as sellers only those that meet the qualifications outlined by the sponsor. This simplifies a prospective buyer's search and evaluation task significantly. The sample order quantity purchasing features (also described in more detail below) of the present invention, significantly reduce the time it takes for a buyer to qualify a new supplier or seller anywhere in the

world.

As mentioned above, most companies would prefer not to pay for volume goods with credit cards, since that it the equivalent of paying cash in advance. When that is coupled with the difficulties encountered by those attempting to pay for merchandise online, especially in countries that do not handle credit card transactions, it can be seen that the sample ordering and multiple payment vehicle features of the present invention also contribute to improved international transaction processing. This is especially true for buyers and sellers that are new to each other.

With reference now to Figure 27, an overview block diagram illustrating the international transaction processing features of the present invention is shown. As seen there, multivariate negotiations engine system 02 is connected over an international network IN, such as the Internet 04. Those skilled in the art appreciate it could also be a proprietary network or virtual private network, if desired. For international processing, sponsored community CC might be a community of sellers of electronic components 08s located in Pacific rim countries. Prospective buyers 08b can be located anywhere in the world, such as Russia, Europe, Africa, South America, North America, and so on.

Since, as mentioned above, credit card online payment vehicles are difficult or impossible to implement in some countries, the present invention enables the use of several internationally accepted payment methods and automates the negotiation of

them, along with the negotiation of the overall agreement. The payment vehicle most commonly used when the buyer and the seller are complete strangers to each other is the letter of credit (L/C).

In a proposed letter of credit, such as that shown in Figure 16, the buyer's bank
5 assumes the full credit risk, and is absolutely obligated to pay the seller, provided the seller ships goods in a way that conforms in every detail to the terms of the letter of credit. Minor errors such as typographical or facsimile reproduction blurring of a document are one of the most frequent causes for letter of credit payment disputes between buyers and sellers.

The present invention enables, as part of the negotiations process, the negotiation of the terms of a letter of credit as seen in Figure 16. The letter of credit shown there, if accepted by the deciding entity DE as part of the negotiations, can be transmitted over a SWIFT compatible network to the advising bank, for immediate implementation. Thus,
15 if the participants are unwilling to pay using credit cards or CYBERCASH™ payment methods, (which are essentially cash payments in advance) a seller can still activate a Website automatically and take volume orders if it is willing to negotiate letters of credit, wire transfers, documentary collection procedures or to accept a buyer's purchase order.

Figure 30 illustrates a wire transfer negotiated using the present invention. Wire
20 transfers shift the risks from the bank to the participants. Documentary collection

payment methods, purchase order payment methods, procurement cards and similar methods can also be used and negotiated using the present invention.

Remote Web Authoring

Figure 10 shows the Web authoring features of the present invention as they are displayed to a participant seller through the sponsor's Web setup area. As can be seen there, Web page buttons, such as general information button 100, home page button 104, and so on, can be selected by the user at its browser to edit or preview a particular part of the website. Thus, the setup area takes advantage of existing web browser technology to simplify the authoring process.

In Figure 4a a flow diagram of the initial part of remote Web authoring 214-02 is shown. In this diagram, it is assumed that a seller is registering for the first time with a sponsored commerce community. Other types of communities might vary this processing. First, at step 400, the seller chooses from one or more templates provided by multivariate negotiations engine system 02, based on the level of cost and functionality the seller desires. Sample website pages constructed from such templates by a hypothetical company named Exports, Inc., are shown in Figures 31a to 31d.

Next, at step 405 in Figure 4a the seller provides basic information as prompted by the system through a setup screen such as that shown in Figures 10-1-10-3. Portions of the demographic information collected there, along with other data collected later is automatically formatted along with the META tags and Meta Keywords for automatic

submission to search engines. At step 410 in Figure 4a, the system presents the community's standard license agreement and terms to the seller. If the seller agrees to the terms at decision block 425, processing continues. If the seller does not agree, the seller may proceed to block 420 to negotiate with sponsor or elect not to participate.

- 5 Still in Figure 4a, if the seller has agreed to the sponsor's terms for participation at step 425 payment terms are executed if the sponsor requires online payment. Any of a number of payment options provided by the system can be used. If payment has not been settled, as determined at block 430, the seller and sponsor can negotiate some more, or the seller may again elect not to participate at block 445. If the seller chooses not to participate, remote Web authoring 214-02 stops. If payment has been settled, the sponsor provides instructions at step 440 to the seller for proceeding to the creation and customization of the Website.

- Turning now to Figure 4b, processing steps for the customization of the seller's Website in the community are shown. At step 455, the seller logs into this part of
- 15 multivariate negotiations engine system 02 using the username and passwords it selected when entering demographic data in the previous registration steps. At step 460, the seller, having already selected a general template for a Website, selects a customization item from those that are specific to its template. At step 465, the seller is presented with instructions and suggestions as it customizes features using an online
- 20 form such as that shown in Figures 10-1-10-3. Sellers with a small inventory of goods can simply create a product catalog online using the web authoring features of the

present invention.

Sellers with existing digital versions of their product catalogs or inventory tracking systems are able to integrate them with the present invention using application programming interfaces (APIs), file transfer protocols (FTP), or extensible markup language (XML), which latter method is in the final stages of becoming a standard language for the Web.

At any time in this process, the seller can preview the Website to see what it looks like so far. At decision block 470 the system checks to see if the seller has completed customizing. If it has, the system enables the seller for active status and online commerce at step 480. If customization is not complete, processing continues from step 460.

Sponsored Community

With reference now to Figure 1j, a diagram of the sponsor functions 213 is shown.

Generally speaking, a sponsor 06 builds a community and establishes its rules 213-02.

In one embodiment, a sponsor 06 can create the community Website from templates available from multivariate negotiation system 02's site. In other embodiments, a sponsor may have already invested millions of dollars in the creation of its own database(s) and Website, and simply wants to have the community enabled from there, using applications programming interfaces (API's) or the new XML language when it is standardized. The present invention permits either or both methods of creating or

enabling a community Website.

As seen in Figure 24, the rules or standards for the community can be as comprehensive or as simple as the sponsor 06 desires. For a commercial site, for example, sponsor 06 may want to require all sellers to be compliant with a particular standards organization's applicable quality standards, such as the International Standards Organization (ISO), shown as R1 here. Additionally, sponsor 06 may want to insure that all fees due to sponsor from sellers are paid in full and kept up to date - rule R5. As another example, a sponsor for a regional trade development community may want to insure that each seller is able to handle importing and exporting of goods - rule R3, meets some specified minimum performance capabilities such as rule R6, just-in-time capability or rule R7, bar code processing, or rule R8, ability to handle specified payment methods.

As seen in Figure 6, the sponsor functions 213-04 are also involved in the remote Web authoring functions 214-02. At step 490, after sponsor determines the seller is in good standing, sponsor register's seller's company name, products and other data with the community's internal search engine. Next, at step 505, sponsor registers the seller's name with Internic, the corporation established for assigning domain names and URLs. At step 510, sponsor automatically submits seller's name and data to major external search engines on the Internet. At step 515, the sponsor completes the integration of the new seller into the community, enables it for active status, includes it at the top of the list of any vendor databases and allows the seller's Website access to the online

community's functions.

Returning to Figure 1j, another principal sponsor function is promoting visibility 213-04. In this capacity, a sponsor 06 may submit its own Website and URL's to a number of Internet search engines and submit each selling participants' Websites and URL's to such search engines as soon as the seller is registered and has created a Website. A typical sponsor's promote visibility functions 213-04 formats the URL's and domain names (as provided by the system registration forms which are automatically integrated into the system) into the META Tags and Meta Keywords or similar formats and submission schedules most likely to speed up registration with the search engines. For example, the ALTAVISTA™ search engine Web site states that:

The Altavista indexer gives higher priority for keywords located in submit tags (META Tags and Meta Keywords), a higher priority for keywords that are located near the top of the page, and also gives a tad higher ranking for keywords appearing closer to each other on the page text. It adds up the occurrences of the keyword in the page for higher scoring. If META keyword tags are not present, it indexes the first 30-40 words of the page as the page description.

Since, as noted above, it may take the ALTAVISTA™ search engine and others, as many as three months or more to index a site on a purely random basis, submissions such as this can significantly improve the visibility of the new seller Websites from the

outset. Automating submissions to them further speeds up this process. In addition, aggregating all of the submissions under the sponsor community hierarchy is likely to generate exponentially more traffic as it takes advantage of the Internet's architecture and search engine indexing capabilities. Traffic, such as inquiries by potential buyers
5 against any of the keywords submitted for the community site will come into the community environment.

Figure 25 is a flow diagram illustrating how the present invention automates this notification process. As seen at step k1, promote visibility function 213-04 creates a script in any of the scripting languages used on the Web, from the information supplied when a participant 08, such as a seller, registers with the community for the first time. In this embodiment, the script is written to take the seller's data and create META Tags and Meta Keywords to assist with the location of the URL's.

Next, at step k2, promote visibility function 213-04 checks to see if it is time to submit the data to a selected search engine n. As noted above, some search engines accept
15 submissions only on a weekly basis, at specified times. If search engine n is not accepting data at this time promote visibility function 213-04 proceeds to step k3 to wait the specified interval. If it is the right time to submit visibility data to search engine n, promote visibility function 213-04 does so at step k4. At step k5 a check is made to see if any more submissions should be made to search engines. If there are several more to
20 process, promote visibility function 213-04 finds the address of the next search engine, which now becomes search engine n, and returns to decision block k2. If it has been

5 engines. The present invention also schedules updating submissions on a regular basis to insure most search engines place community sites near the top of their index lists.

SECRET

15 links to and from other Websites to direct more “traffic” to the sponsor’s Website, and either directly or indirectly all the seller’s Websites within. This is useful when sellers or sponsors or both already have established brand name identities and traffic patterns through their own individual traditional and Web-based brand recognition marketing efforts.

Non-repudiation

Referring again to Figure 1i, it can be seen at step 212-10 of the multivariate negotiations engine 212's processing, that each "round" or step of negotiations is stored and archived by the present invention. This is of special benefit to any participants negotiating a binding agreement who may later disagree as to the exact intent or content of the final terms. This archival processing allows either side or the sponsor or moderator (using the appropriate usernames and passwords) to view the steps leading up to the final document. The likelihood of potential disputes arising over what has been historically referred to as the "battle of the forms" can be greatly reduced, or even eliminated using this archival feature. These non-repudiation features of the present invention are likely to significantly reduce the incidence of "inadvertent lapses of memory", since "memory" can easily be refreshed from the archives. This, coupled with other security and validation features of the present invention mentioned above, provides a more complete non-repudiation system than is presently available.

That is, the present invention provides authentication by validating the identity of the participants through user names and passwords; maintains confidentiality by using SSL encryption and decryption to ensure that confidential information is not intercepted during transmission; provides security of the data stored at multivariate negotiation engine system 02's site through use of IP firewall 203f; and by virtue of the archival features, provides documentary non-repudiation by ensuring that transactions, as they are negotiated and committed are fully documented. Those skilled in the art will appreciate that existing security techniques such as public key encryption (PKI) systems,

certificates of authentication, among others can also be used to enhance the integrity of the documentary archives.

Figure 28 illustrates this in simple overview format. As seen in figure 28, buyer terms BT1 include an order for 10,000 widgets, etc, requesting a 4-year warranty on parts and that buyer's performance or payment be excused for acts of God which are here proposed to include strikes and government actions. Using the present invention, these terms are stored for review by the seller. Seller terms ST1 indicate the seller would prefer to offer only a 6 month warranty on parts and would not include strikes or government actions under the heading of acts of God which would excuse the buyer from paying for the goods. The buyer responds with proposed buyer terms 2, BT2, which ask for a 1 year warranty and the inclusion of government actions as an act of God.

In this example, the seller accepts buyer terms BT2 and this is reflected in the final deal terms FD. If, at some later time, the seller demands payment from the buyer at a time when the buyer is unable to send money out of the country because of government action, these non-repudiation features make it clear that the seller had agree to excuse performance in that circumstance. Thus, the seller cannot say "I was positive we had eliminated two of your requested terms for inclusion as acts of God, and since our copy of the final terms has been destroyed, and you cannot find yours, I demand you pay."

The present invention significantly increases the likelihood of preventing such not uncommon occurrences as disputes arising from lost or misplaced copies of documents.

Sample Ordering

For production purchasers, sample orders can be placed at the outset of vendor selection processes by a production buyer. If the sponsor desires to include this feature in the community, it will make arrangements with each seller for the payment for the samples. In order to enable a seller to "go live" immediately upon the creation of the seller's Website, a sponsor might authorize payments for such sample purchases through the Sponsor's own merchant id or similar arrangements for online payment processing. This eliminates the need for the seller to wait several weeks for a merchant Id in order to accept credit card payments for small value transactions such as sample orders.

Often a seller's ability to accept sample orders in specified quantities upon agreed upon payment terms will be one of the rules of the community. Once a buyer has placed an order for sample quantities, the system automatically sends a notification to that effect to the seller, as seen in Figure 23. The seller, having previously agreed to accept sample orders is now obligated to ship the quantity of the items as specified by the buyer. In a typical implementation of this feature, the seller's normal shipping and handling terms apply. If the sponsor and sellers agree to accept payment for samples by credit card or procurement card, the sponsor can process the payments online using its own accounts, and then remit the proceeds from the payments, less its fees for handling, to the seller by wire transfer or other standard payment methods.

Referring briefly to Figure 2c (Prior Art), it can be seen that the prior methods of

ordering sample quantities were heavily labor intensive. A person P1, from the prospective buyer organization would look through a hard copy product catalog, place an order by facsimile or telephone, and possibly fly to the seller's factory, where face to face negotiations might occur with seller's representative P3. Buyer P1 might also have to negotiate by fax and telephone a letter of credit with its bank representative P2, before all price, payment, and other terms are completed so that payment can be arranged to occur upon shipment of the sample quantities. As noted in the background section above, this traditional approach is usually lengthy, costly and labor-intensive.

Referring now to Figure 29, the present invention enables a prospective buyer to electronically search a sponsored community site at step SO1 for sellers of goods meeting buyers needs. As mentioned under international transaction processing, above, this ability to find new, possibly pre-qualified suppliers over the internet is a significant advantage for production buyers.

At step SO3, the sponsored community displays to the buyer the sellers with goods meeting the needs. At step SO6 the buyer can link to the sites of the sellers listed in the display, and either send email inquiries to them (step SO6), or directly order sample quantities from them (step SO10) or evaluate them at step SO12. If the buyer likes the samples and wishes to negotiate terms for placing an order in volume, it can proceed to Steps SO14 through SO20 to do so.

As mentioned above, this ability to order and receive sample quantities quickly has



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designated by buyer has been completed between the two of them through the system. Similarly, the buyer in the above example is likely to be entered in several of the seller's databases.

A typical sponsor 06's administrative database DBa, in Figure 1f, includes such things as templates, procedures, and charges for registering new sellers, procedures for recognizing and assigning passwords to buyers, procedures for automatic renewal, details of each sellers required banking information, and so on. Sponsor 06's vendor database DBb, might be a listing of all the potential vendors in this general market. For example, if the general market for which sponsored community CC was created is the market for power supplies for electronic equipment, then all the makers of power supplies might be included in a brief listing in this database. As a manufacturer of power supplies for this market registers with the sponsor 06, agreeing to meet all the conditions specified for inclusion by sponsor 06, it is automatically placed, by multivariate negotiations engine system 02, at the top of a list of vendors in vendor database DBb. Thus, when potential buyers are browsing through the community Website CC, they will find the registered sellers at the top of vendor database list DBb, with others listed in lower priority order.

Typical sponsor vendor database Dbb includes text, images, sound files, etc.. When information from one or more of these databases is called for, the present invention pulls such associated files and graphics for display to the requestor. Typical sponsor 06 databases 225 also include demographic data about registered sellers, such as company

name, title, and locations. If certificates of authenticity, customer identification numbers, or electronic signatures such as those conventionally used for non-repudiation purposes are collected, they can also be stored in a sponsor database 225. Consequently, the services available from a typical sponsor 06 using the present invention, can make production purchasing more efficient for a buyer and provide direct access to potential buyers for all registered sellers.

As seen in Figures 1f and 1o, database 225 of the present invention is automatically integrated with the functions of the multivariate negotiations engine system 02. As HTML text is received, requests and data are extracted from it (as described in more detail below) into dynamic HTML for storage in database 225 in the appropriate "folders" for the respective members.

With reference now to Figure 5a, it can be seen that database functions 222 communicate directly with webserver 210s through IP firewall 203f in the present invention. The traditional approach to addressing database concerns over the Internet usually involve a webserver, an application server software product, and a database software server product. As can be seen in Figure 5a, this embodiment of the present invention does not use an application server software product. Instead the functionality that is needed to receive and transmit information to and from a participant 08, over a communications path through webserver 210s of multivariate negotiations engine system 02 is accomplished by using common gateway interface (CGI) programming such as perl, C++ and Java. Those skilled in the art will appreciate that other scripting

and programming languages could be used as well.

As seen in Figure 5a, CGI programming is used between participant 08's browser software at the participant's site, to handle communications between participant 08 and multivariate negotiations engine system 02's webserver 210s. CGI programming is used to dynamically create Web pages based upon the participant's request.

In the embodiment shown in Figure 5a, communications between webserver 210s and database functions 222 are conducted directly also using languages Java, perl and C++, without the use of an intervening application server software product. Most of the functions of an applications server product are thus programmed directly either into webserver 210s or database functions 222 using web-based programming techniques. This approach tends to save both space and time and has the advantage of simplifying the operations at both ends, since functions can be streamlined. In particular, reporting can be more flexible than if a standard application server software program were interposed between webserver 210s and database functions 222. Those skilled in the art will appreciate that more traditional application server software products could still be used, if desired, as could other languages or scripting languages.

For example, and still in Figure 5a, if a buyer participant 08 wishes to place a proposed order, the browser encrypts it at the browser's secure socket layer and webserver 210s decrypts the proposed order upon receipt at multivariate negotiations engine 02's site. Webserver 210s next analyzes the proposed order to understand it and formats into a

request sent to database functions 222. In addition to basic read and write functions, database functions 222 shown in Figure 5a, include operations such as search, analyze, compare, report, sort and relate (between databases.) Formatting can be as simple as "user = username" etc. A request such as "find user=username; return catalog" might
5 be sent through IP firewall 203f.

Using object-oriented techniques, the database is ordered more compactly to provide faster search capabilities. Those skilled in the art will appreciate that traditional flat file and relational or other database structures could be used as well.

Figure 5b, for example is an illustrative database entry as it might be stored for a listing in a vendor database DBb. In this example, login is shown as 579 - - the unique ID assigned by multivariate negotiations engine 02 to this particular vendor. The remote web authoring template chosen by this vendor is shown as template 4, the vendor's letter of credit bank information is listed, and so on.

System of Record

Now turning to Figure 33, a complete automated system of record CP00 of the present invention is shown. In the embodiment shown, sponsor 06 has, as described above, created the basic sponsored community and rules that will be used as part of the automated system of record CP00. However, the deciding entity DE of two participants could also serve as a sponsor 06 if desired. Contract authority CP02 assigns a unique
20 identifier CPNN to each major negotiation and its ensuing activities. In the embodiments shown, this identifier is used to identify all the items associated with a

Automated negotiations engine 02 is used to negotiate from the active templates CP08, in addition to any other user-supplied context. For the users who wish to maintain the data contained by automated system of record CP00 at one or more sites other than the central site, multiple repositories CP12 can be used to accomplish this, as will be seen in more detail below. With the use of dynamic contract CP06 and active templates CP08, automated negotiations engine 02 can also be used more readily to negotiate other types of “contracts”, such as specifications, or even to automate the negotiation of some or all of the development of a new product, as will be described in more detail below. Still in Figure 33, process mining CP10 is a function of the present invention that can be used in conjunction with automated system of record CP00 to evaluate the results of internal, external or even joint processes used to implement the contracts reached, as will also be described in more detail below.

Figure 34 shows a configuration of the automated system of record CP00, having, in the public section, a contract authority CP02 communicating with automated negotiations engine 02, and a contract router CP02R, which functions in much the same way as a communications network router, although in the present invention what is being routed is negotiation information related to contract identifiers CPNN. Following the communications analogy, in this configuration of automated system of record CP00, a contract central switch CP02CS is also shown in the public area. Contract central

[illegible]

system interfaces CP50, such as HTML CP52, XML CP54, Enterprise java beans EJB, CP56, and EDI CP58, can communicate to use automated negotiations engine 02, to apply contract terms through contract authority CP02, and to track data through process mining CP10. The information in these systems, in turn can be used to work
5 with internal systems CPINT as well as external systems CPEXT.

Turning now to Figure 43, a flow diagram for sponsor 06's interaction with automated system of record CP00 is shown. At step CP100, sponsor 06 establishes rules for the sponsored community, using techniques described above. Next, at step CP102, sponsor 06 obtains a unique identifier CPNN from contract authority CP02 of the present invention. In the embodiments shown, contract authority CP02 typically manages blocks of unique identifiers, which are each generated in such a way that they insure that number will never be generated again. So, for example, contract authority CP02 could start with a block of numbers, and then as new blocks of numbers are generated they are compared with previous blocks to insure there is no duplication.

Still in Figure 43, once a unique identifier CPNN has been obtained, sponsor 06, at step CP104 associates its contract active templates CP08 with that number for acceptance by the participants. At step CP106, sponsor 06 asks the participants who are going to be involved in the negotiation associated with unique identifier CPNN if they wish to submit any other active templates CP08. Turning briefly to Figure 40, an excerpt from
20 a contracts active template CP08a is shown, having predefined fields in specified formats for such items as item number, price, quantities needed for discount to apply,

the discount, Ship schedule, Incoterms and so on. Active templates CP08 are designed either by sponsors or participants or both to represent data being negotiated in such a way that certain fields can be used automatically by other programs such as logistics tracking programs, bill of materials programs, ERP systems and so on. Typically, this requires that the field be specified and formatted in such a way that the programs that will use it can either read the information directly from a record or sub record in the active template CP08 or can accept the information in that format when supplied with it as an input parameter.

Figure 41 shows an active template CP08b which contains information that might be used to program a programmable logic machine operating a lathe.

Next, in Figure 44, a buyer participant's use of the automated system of record CP00 is shown in part. As mentioned above, while commercial applications between buyers and sellers are used for illustration purposes, and the term contract is used to refer to a finally agreed upon set of terms, those skilled in the art will appreciate that the invention could be used for non-commercial applications, as well.

Still in Figure 44, at step CP108, the buyer sets and sends its specifications for a product to be developed and associated with the unique identifier that will govern a contract to be negotiated, in this example, the agreement will be a major agreement governing both the development as well as the purchase of that product. At step CP110, the buyer agrees to use the contract active template CP08 supplied by sponsor 06. Those

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present invention is shown. At step CP132, once contract negotiations are completed, the contract active template CP08 will be used to automatically inform buyers (or seller's or both) ERP systems, such as those provided by SAP, Oracle, Inc. Or Peoplesoft, Inc., among others, of the details of the contract which are relevant to it, such as items, price, quantity, shipping instructions. In the example of Figure 46, the buyer at step CP136 initiates its order tracking systems, and logistical tracking systems, even though development and shipping have not even started yet. Next, at step CP138, the buyer and seller can perform technical negotiations using the active templates CP08 supplied by buyer for its product requirements and automated negotiations engine 02. When final agreement has been reached on the technical negotiations seller, at step CP140 starts development. If the active templates CP08 allow, buyer can, at step CP140 track the developments as well. Finally, at step CP148, seller ships the product in production quantities, which usually activates order tracking and logistics tracking operations, which continue to execute at step CP146 on an on-going basis. At some point, at step CP144, either buyer or seller may want to use process mining CP10 (described in more detail below) to determine whether its respective processes are as efficient and effective as desired.

For tracking processes between companies or entities, the flow diagram of Figure 47 illustrates how the present invention can be used. At step CP150 during a negotiation, the buyer asks seller to cooperate in such an endeavor, and at step CP164, seller agrees. Next at CP152, buyer requests notification be sent to seller through automated system of record CP00 by its own internal purchasing department, and at step CP166, internal

purchasing agrees to do so. At step CP154, buyer requests that seller send a notification through automated system of record CP00 when the order is received by seller and at step CP168, seller agrees to do this, too. Similarly, at steps CP156, CP170, CP158, CP172, buyer and seller agree to exchange notifications through automated system of record CP00. At step CP160, buyer requests that its internal receiving department also participate in sending notices, which is agree to at step CP174. Finally, at step CP162, which may be some time in the future, buyer starts processing orders.

Now turning to Figure 48, process mining CP10 of the present invention is shown. At step CP180, an alert is received to initiate process mining CP10. An alert can come from any of a number of sources, such as a request by a buyer, a seller or a sponsor. At step CP182, the alert containing the requested unique identifier CPNN associated with the major negotiation whose processes are to be mined, is validated by contract authority CP02's security CP04 against the contract identifier CPNN maintained by contract authority CP02 in database 225. Security CP04 also checks, at step CP184, to see if other information supplied with the request matches the information associated with unique identifier CPNN in database 225. If it does not, an error notice is provided. If all matches, control flows to process mining CP10 at step CP186, which stores the validated request information in database 225, and proceeds at step CP188 to measure the time, revenue, and inventory changes between event dates specified in the request. As seen from Figure 47, events such as these can be tracked using database 225 of automated system of record CP00, using the notices provided by the procedures set up in Figure 47. Thus, if process mining CP10 is used to analyze logistics within seller's

internal systems, it might turn out that when seller uses its own fleet of trucks for delivery, deliveries are 1 to 3 days late, on average, while deliveries made by a delivery company are never more than 1 day late. Thus, at step CP190, process mining CP10 can evaluate the time and revenue consequences of this for profits for this product.

- 5 Similarly, process mining CP10 might, at step CP192 propose contract changes as simple as a change of shipper. If the changes are acceptable to the parties, process mining CP10 can amend the contract with the agreed upon changes, using automated negotiations engine 02 at step CP194.

With reference now to Figure 49, use of automated negotiations engine 02 for iterative, multivariate technical negotiations is shown. In the example here, a buyer manufacturer that normally produces its own equipment using programmable logic computers to operate a lathe, wants to subcontract the work to a consulting engineering company. At step CP200, the manufacturer indicates to the consulting engineering company that it wants to program the lathe. At step CP202, the manufacturer uses dynamic contract CP06 to present high level programming options to consulting engineer. At step CP204, consulting engineer enters the parameters into its PLC program, which, at step CP206 demonstrates output that would result. At step CP208, the consulting engineer refines the parameters, reruns the system at step CP120. At step CP212, the engineer uses the final PLC settings, and at step CP22, the PLC program, if it has an assessment capability

20 assesses the cost to create the product using those parameters. At step CP220 the engineer approves those charges, at step CP218 the PLC system is deployed, at step CP216 all the relevant systems known to automated system of record CP00 are notified

of the context. Finally, at step CP214, the finished PLC application is available for further use.

Those skilled in the art will appreciate that other technical negotiations can be automated in whole or in part, as well. For example, Autodesk's AutoCAD™ software allows users to generate mechanical computer aided design drawings which include part numbers, from which a bill of materials is produced. Agile Corporation's Agile Product Definition Server can take the bill of materials parts information from AutoCAD™ and publish and manage it for sourcing parts. Similar systems are provided for VLSI CAD designs by such companies as Windchill and Mentor Systems.

With reference now to Figure 50, the multiple repository functions CP12 of the present invention are diagrammed in flowchart format. As mentioned earlier, the data created by use of automated negotiations engine 02 and automated system of record CP00 can be stored at one central location, such as sponsor 06's site. Using the multiple repository functions CP12, a participant can request that automated system of record 02 also maintain a copy of the items relevant to that participant in a local repository. Figure 50 shows the steps used to manage this. At step CP300, multiple repository function CP12 receives an update to primary database 225. At step CP302, it looks to the contract terms to determine which local repositories need to be updated. At step CP304, for each system to be updated, the transaction is written to an output list for delivery and at step CP306, each local system receives the transaction and applies it. To maintain transactional integrity when updating two or more systems with the same transaction,

products such as BEA corporations TUXEDO™ product, or IBM Corporation's Transarc Encina product or Microsoft's Transaction Server or MTS™ product can be used In the embodiments shown, the TUXEDO product is used.

Still in Figure 50, at step CP308, it can be seen that the original system is where the contract or agreement lives and at step C310, other systems use this transaction to inform their local processes, e.g. pass parameters to an ERP system, for example.

Now turning to Figure 51, a flow diagram of security CP04 is shown. At step CP320, when an agreement is negotiated using automated system of record CP00 and automated negotiations engine 02, the contract documents are created with security extensions, such as access control lists, privileges lists, etc. which all parties agree to accept. At step CP322, contract authority CP02 assigns a unique identifier CPNN to associate with all related documents and terms. At step CP324 one party agrees to accept a contract template which indicates security baselines. At Step CP326, the other party accepts them, too. If they do not accept or wish to add or modify the templates, they can do so at steps C328 and CP330 respectively. At step CP332 agreement is reached and at step CP334, the initial contract documents are loaded into a contract router CP02R (if the router configuration is used) and automated system of record CP00 is started using these documents as the inputs to automated negotiations engine 02. From then on, at step CP340 permitted transactions are processed and at step CP336 invalid transactions are recorded and logged.

Those skilled in the art will appreciate that the embodiments described above are

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